COMPUTER CONTROLLED
STEREO INTEGRATED AMPLIFIER

A-7X
SERVICE MANUAL

KENWOOD

KENWOOD CORPORATION

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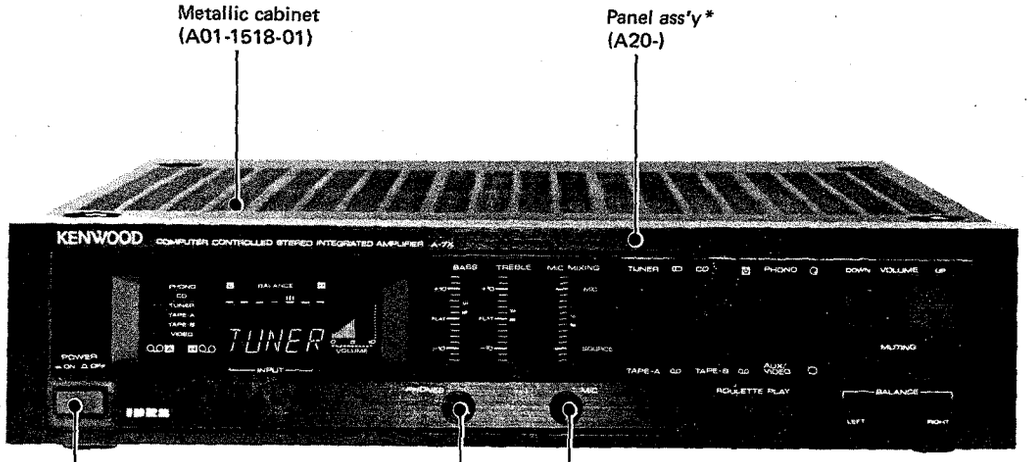
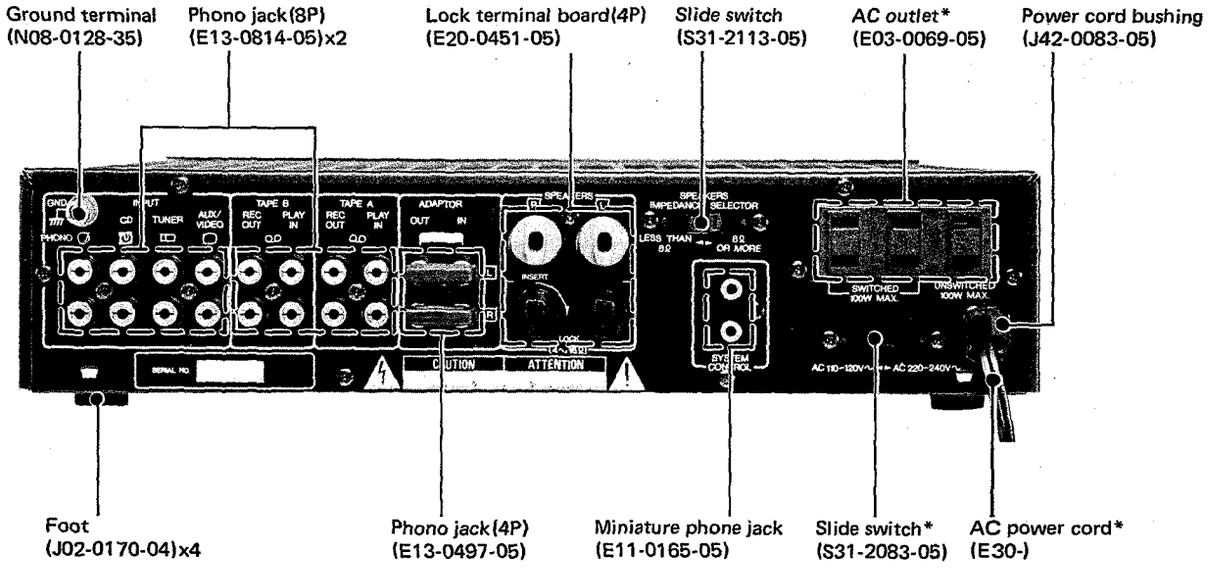




* Refer to parts list on page 24.

A-7X

In order of top photo :
P-7X
RC-9X (REMOTE CONTROL SYSTEM)
T-7LX
A-7X
X-7WX

S-7X (SPEAKERS)

Photo is MIDI M-70 and RC-9X (REMOTE CONTROL SYSTEM).

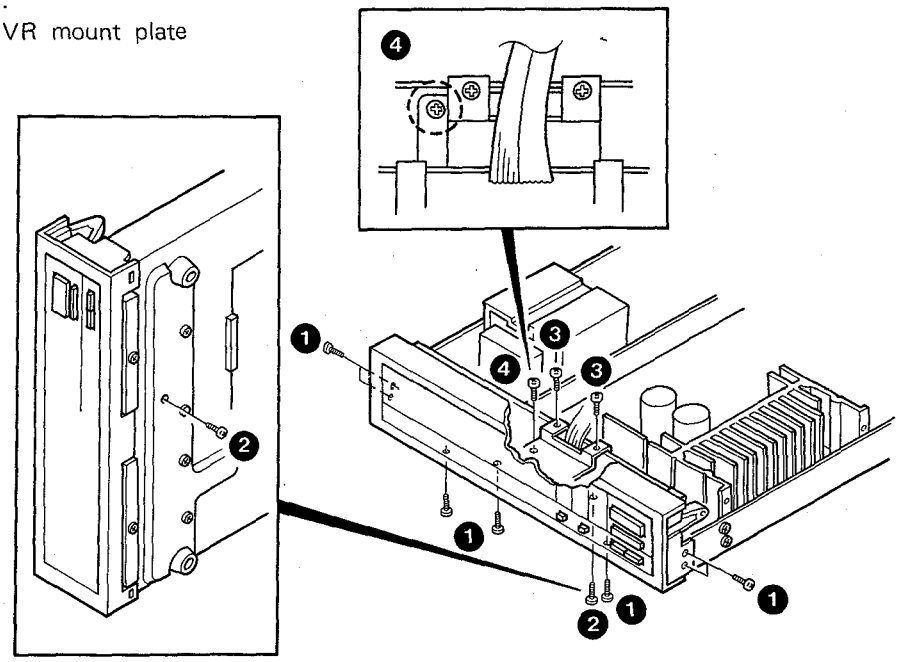
System configuration and carbon box (for system packing).

The system configuration and system packing carton box except speakers are as follows.

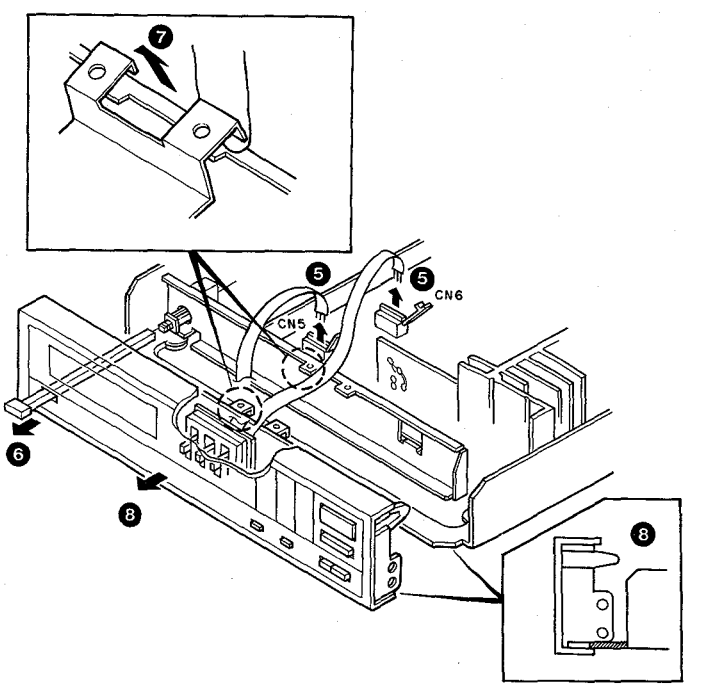
SYSTEM	AMP.	TUNER	CASSETTE DECK	TURNTABLE	SPEAKER	CARTON BOX
M-30	A-3X	T-3LX/3X	X-3WX	P-3X	S-3X	H03-0878-04
M-40	A-3X	T-7LX/7X	X-3WX	P-5X	S-3X	–
M-50	A-5X	T-7LX/7X	X-5WX	P-5X	S-5X	H03-0879-04
M-50X	A-5X	T-7LX/7X	X-3WX	P-5X	S-5X	–
M-70	A-7X	T-7LX/7X	X-7WX	P-7X	S-7VX	H03-0880-04

DISASSEMBLY FOR REPAIR

1. Remove the four front panel set screws; two at each side and two at the bottom (❶).
2. Remove the single screw from the bottom plate (❷).
3. Remove the two plate set screws (❸).
4. Remove the single screw from the VR mount plate (❹).

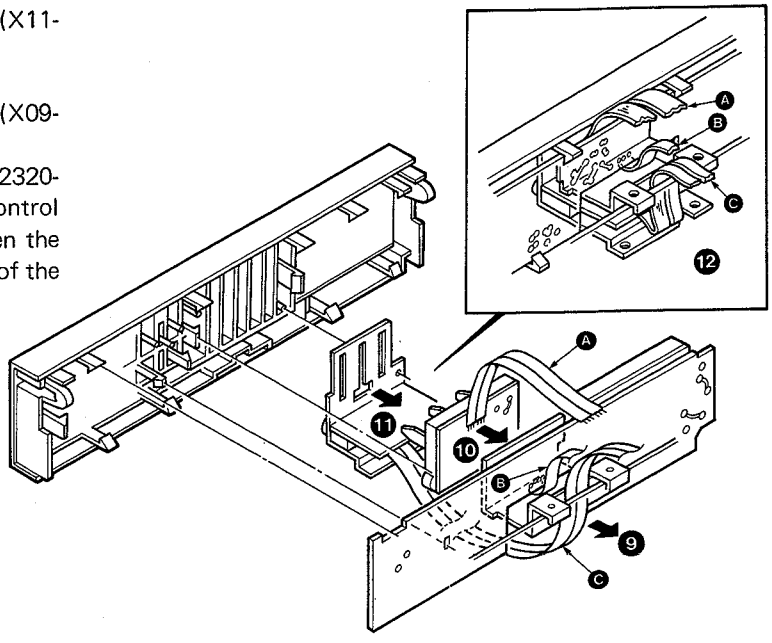


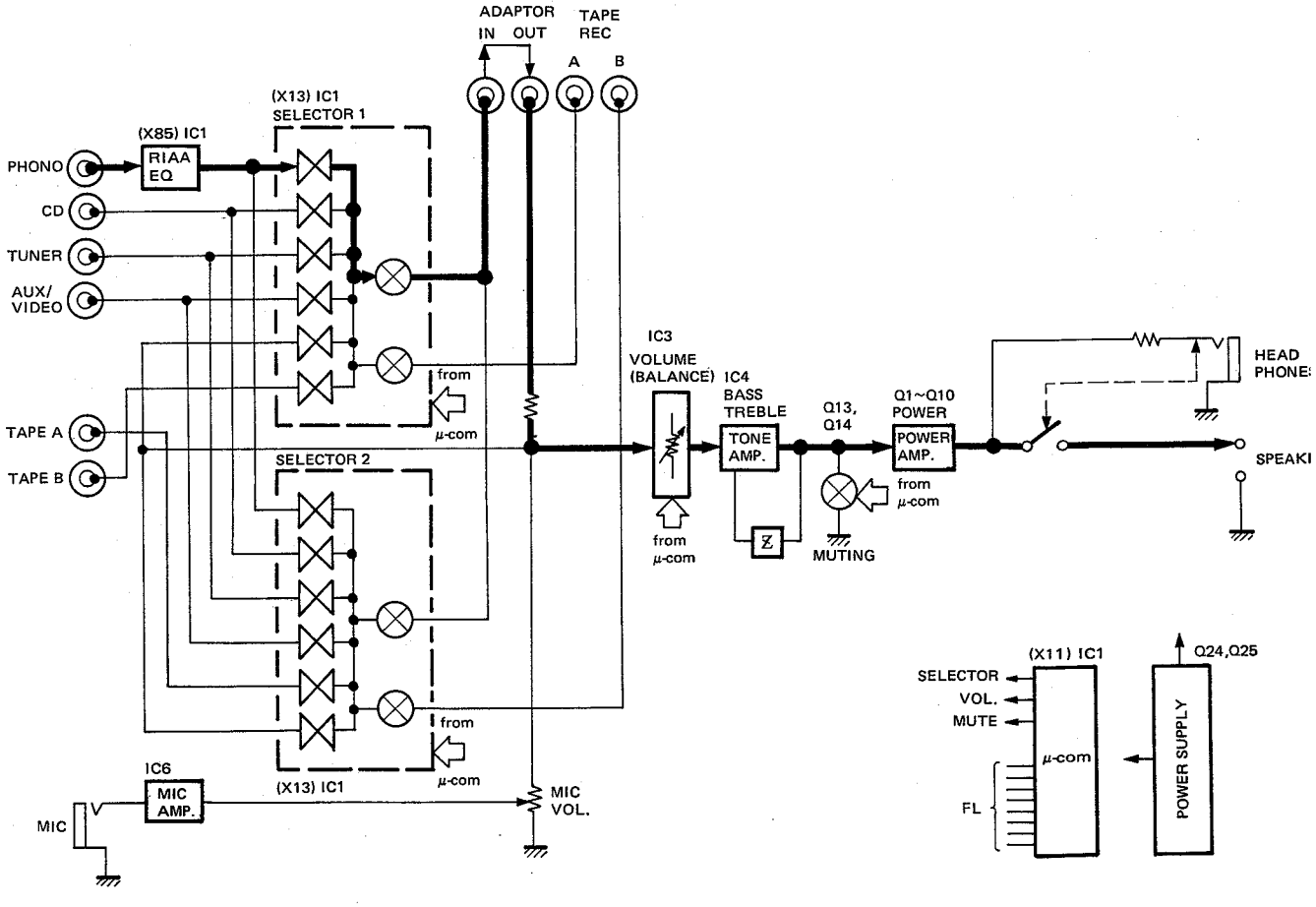
5. Pull the Audio unit (X09-2362-71) (A/6) cable connectors CN5 and CN6 off (❺).
6. Pull the POWER switch knob off (❻).
7. Raise the plate with your fingers (❼).
8. Pull the front panel toward you while holding the plate raised to clear its bends the plate on which it rested (❽).



DISASSEMBLY FOR REPAIR/BLOCK DIAGRAM

9. Unhook the hooks and remove the Control unit (X11-2320-01) from the front panel (⑨).
10. Unhook the hooks and remove the VR1 (⑩).
11. Remove the VR1 mount block with the cable (X09-2362-71) (C/6) attached (⑪).
12. Route the cable Ⓐ over the Control unit (X11-2320-01), pass the cable Ⓑ at the center of the Control unit (X11-2320-01), pass the cable Ⓒ between the VR1 holding plate and the chassis at the bottom of the Control unit (X11-2320-01) (⑫).





CIRCUIT DESCRIPTION

Description of components

AUDIO UNIT (X09-2362-71)

Components	Use and Function	Operation/Condition/Compatibility
Q1~Q4	Drivers	
Q5~Q8	Final power amplifier	
Q9,Q10	Bias current compensators	
Q13,Q14	Front muting circuit	ON during selector operation, while at minimum volume, or for 4 seconds after Power ON.
Q21	Power supply	Supplies power to the microprocessor and provides a back-up signal.
Q22	Front muting circuit driver	Provides a slow-attack and fast-release characteristic.
Q23	A-class amplifier power supply	
Q24	+ 14V constant voltage supply	Supplies power to the selector IC, electronic volume control IC, and microphone amplifier.
Q25	−14V constant voltage supply	
IC3	Electronic VOL. control IC	
IC4	Tone amplifier	
IC6	Microphone amplifier	

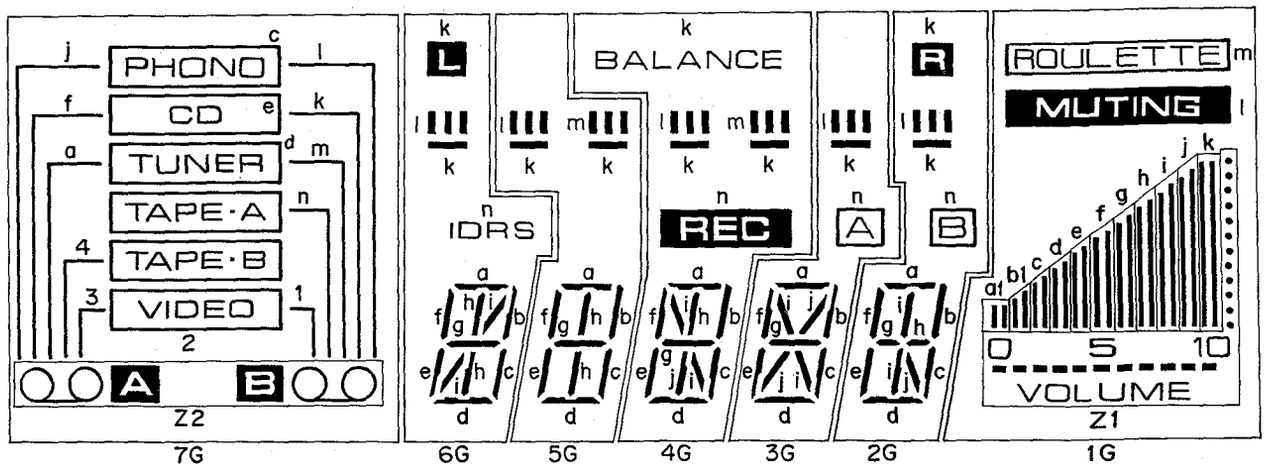
CONTROL UNIT (X11-2320-01)

Components	Use and Function	Operation/Condition/Compatibility
Q1	FL grid current buffer	
IC1	Microprocessor	

SUB-CIRCUIT UNIT (X13-5520-00)

Components	Use and Function	Operation/Condition/Compatibility
IC1	Selector IC	

Fluorescent Display Tube Panel FL1 : FIP7AMW24 (X11-2320-01)



Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Electrode	F	F	NP	7G	P4	P3	P2	P1	PZ2	Pa	Pf	7G	Pj	Pi	6G	Ph	5G	Pb	Pg	
Terminal No.			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
Electrode			4G	Pc	Pe	3G	Pd	Pb1	2G	Pa1	PZ1	1G	Pk	Pl	Pm	Ph	1G	NP	F	F

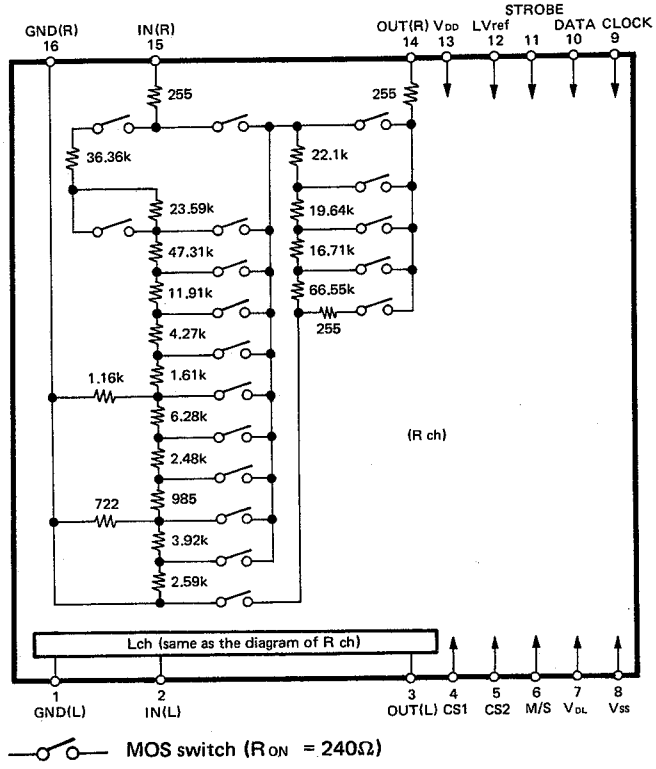
Notes F : Filament G : Grid P : Anode NP : No Pin

Connect segments 1 through 4 with segments b (pin 18), g (pin 19), h (pin 16), and i (pin 14) in any combinations.

CIRCUIT DESCRIPTION

Electronic Volume Controller IC3 : CX7978 (X09-2362-71)

- **Equivalent Circuit Diagram**



- **CX7978 Terminal Description**

Terminal No.	Symbol	I/O	Description
1	GND (L)		Reference voltage (0V) for the L and R channel audio signals.
16	GND (R)		
2	IN (L)	I	Audio signal inputs.
15	IN (R)	I	
3	OUT (L)	O	Audio signal outputs.
14	OUT (R)	O	
4	CS1	I	Chip select terminals which select this chip when the levels of the serial data bits (9), and (10) agree with
5	CS2	I	those of them; CS1 = bit (9) and CS2 = bit (10), where level "0" = Vss and level "1" = V_{DL} or open.
6	M/S	I	Serial data input mode select terminal. The IC expects 8-bit input when this terminal is held at the Vss level while it expects 11-bit input when the terminal is open or at the V_{DL} level.
7	V_{DL}		Logic power supply (Vss = + 5V).
8	Vss		IC substrate potential (−14V).
9	Clock	I	Serial data read clock terminal which provides 8 or 11 read clock pulses at the rise edge of which 8 or 11 data bits are respectively read.
10	Data	I	8- or 11-bit serial input data.
11	Strobe	I	This pulse latches at its rise edge the serial data read in the analog switch status setting pulse (single e pulse) IC which make appropriate switches.
12	L Vref	I	Sets the input level of the control signals (Clock, Data, and Strobe).
13	V_{DD}		Switch driver power supply (+ 14V).

CIRCUIT DESCRIPTION

- **Control Data Bit Assignments**

8-bit configuration (M/S = Vss)

8	7	6	5	4	3	2	1
$\overline{R}$	$\overline{L}$	8dB Step Data				2dB Step Data	

11-bit configuration (M/S = OPEN or V_{DL})

11	10	9	8	7	6	5	4	3	2	1
1	CS2	CS1	R	L	8dB Step Data				2dB Step Data	

8bit (M/S : "L")

Position	Bit 8	7
L + R	0	0
R	0	1
L	1	0
No change	1	1

11bit (M/S : "H")

Position	Bit 8	7
No change	0	0
L	0	1
R	1	0
L + R	1	1

*

Position	Bit 2	1
0dB	0	0
2dB	0	1
4dB	1	0
6dB	1	1

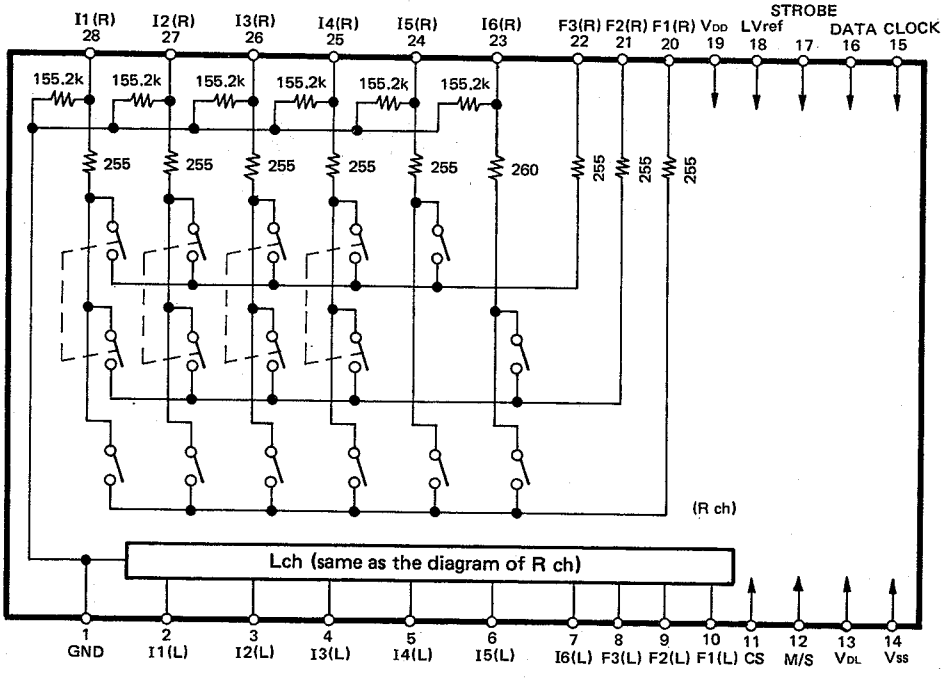
*

Position	Bit 6	5	4	3
0dB	0	0	0	0
8dB	0	0	0	1
16dB	0	0	1	0
24dB	0	0	1	1
32dB	0	1	0	0
40dB	0	1	0	1
48dB	0	1	1	0
56dB	0	1	1	1
64dB	1	0	0	0
72dB	1	0	0	1
∞	1	0	1	0

* The attenuation is the sum of the 8-dB and 2-dB increments.

Selector IC1 : CX7977 (X13-5520-00)

- **Equivalent Circuit Diagram**



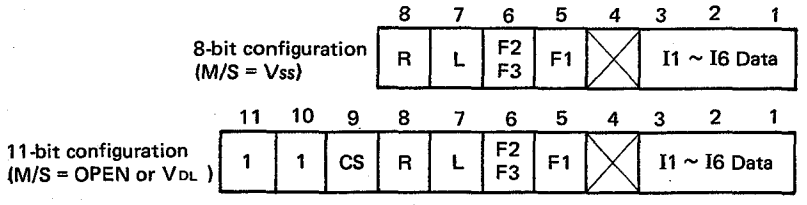
MOS switch (R_{ON} = 240Ω)
F2 and F3 switches work in conjunction.

CIRCUIT DESCRIPTION

• CX7977 Terminal Description

Terminal No.	Symbol	I/O	Description
1	GND		Audio signal reference potential (0V).
2~7	I1(L)~I6(L)	I	L-channel audio signal input terminals (6 lines).
8~10	F3(L)~F1(L)	O	L-channel audio signal output terminals (3 lines).
11	CS	I	Chip select terminal selects this IC when the level of the serial data bit (9) agrees with that of this terminal; i.e., CS = bit (9), where level "0" = Vss and level "1" = V_{DL} or open.
12	M/S	I	Serial data input mode select terminal. The IC expects 8-bit input when this terminal is held at the Vss level while it expects 11-bit input when the terminal is open or at the V_{DL} level.
13	V_{DL}		Logic power supply (Vss = + 5V).
14	Vss		IC substrate potential (−14V).
15	Clock	I	Serial data read clock terminal which provides 8 or 11 read clock pulses at the rise edge of which 8 or 11 data bits are respectively read.
16	Data	I	8- or 11-bit serial input data.
17	Strobe	I	This pulse latches at its rise edge the serial data read in the analog switch status setting (single pulse) IC which make appropriate switches.
18	L Vref	I	Sets the input level of the control signals (Clock, Data, and Strobe).
19	V_{DD}		Switch driver power supply (+ 14V).
20~22	F1(R)~F3(R)	O	R-channel audio signal output terminals (3 lines).
23~28	I6(R)~I1(R)	I	R-channel audio signal input terminals (6 lines).

• Control Data Bit Assignments


8 7 6 5 4 3 2 1
8-bit configuration
(M/S = Vss)
R L F2 F3 F1 I1 ~ I6 Data
11 10 9 8 7 6 5 4 3 2 1
11-bit configuration
(M/S = OPEN or VDL)
1 1 CS R L F2 F3 F1 I1 ~ I6 Data

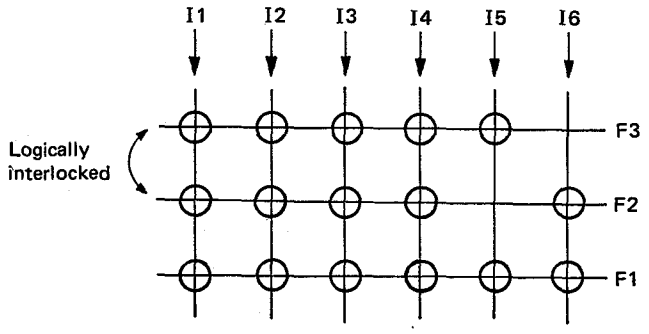
8bit (M/S : "L")

Position	Bit 8	7
No change	0	0
No change	0	1
No change	1	0
L + R	1	1

11bit (M/S : "H")

Position	Bit 8	7
No change	0	0
L	0	1
R	1	0
L + R	1	1

* The F2 and F3 output controls are interlocked.
The I5 input signal is never fed through the F2 line.
The I6 input signal is never fed through the F3 line.
This is well illustrated by the following conceptual diagram:



Each ⊕ indicates an equivalent switch.

*

Position	Bit 3	2	1
I1	0	0	0
I2	0	0	1
I3	0	1	0
I4	0	1	1
I5	1	0	0
I6	1	0	1

*

Position	Bit 6	5
No change	0	0
Output F1	0	1
Output F1,F2	1	0
Output F1,F2,F3	1	1

CIRCUIT DESCRIPTION

1. Microprocessor Operations

1–1. General

The A-7X Computer Controlled Integrated Amplifier succeeds all the functions of its predecessor MIDI Amplifier A-7S. The only difference is the change of indicator elements from LED's to a FIP assembly. The amplifier has 12 control keys, in addition to the POWER switch, which are classified into the following three categories:

(1) Selector keys (6) : TUNER, CD, PHONO, VIDEO, TAPE-A, and TAPE-B.
(2) L- and R-channel volume control keys (5) : VOLUME UP/DOWN, BALANCE LEFT/RIGHT, and MUTING.
(3) Roulette play mode control key (1) : ROULETTE PLAY START/STOP.

These keys control the selector and volume controller IC's enable and muting features, and send and receive communication synchronizing codes to and from the other system components. Simultaneously pressing two or more of the keys in any combination causes no effect.

The operations of the individual keys are described in the following paragraphs by category.

- **Selector Keys (TUNER, CD, PHONO, VIDEO, TAPE-B, TAPE-A)**

The selector keys close a switch of the three selectors in the selector IC which are named Input, REC OUT A, and REC OUT B, effectively selecting an input source component and, if appropriate, routing the signal from the component to either the tape deck A or B for recording. They are effective only when Roulette Play mode is not selected or OFF. Pressing a key causes the selected component name (TUNER, CD, PHONE, VIDEO, TAPE-A, or TAPE-B) to be displayed.
(Even when the volume value is being numerically indicated in dB.)

The REC OUT A and B selectors follow the Input selectors; i.e., the corresponding switch is closed, unless the tape decks A and B are recording in which case the selectors stay fixed to the component from which they are recording. Once either deck is stopped or put in PLAY state, the corresponding REC OUT selector immediately reselects the same input source as the one currently selected by the Input selector.

Note 1 : Turning the amplifier on initializes all the selectors to select the TUNER. It is analog-muted for approximately 4ms.

Note 2 : Pressing a selector key initiates the first analog-muting of an approximately 32ms duration called pre-muting. During this duration switching is done in the selector IC. The pre-muting is followed by the second muting of an approximately 320ms duration called post-muting.

Note 3 : The selector IC requires two control data transfers from the microprocessor for each Input selector switching. A selector control data consists of 11-bits.

Note 4 : Whenever a selector key is pressed, a specific synchronizing code is issued.

Note 5 : Except for the following cases, the REC OUT A and B selectors are automatically set to select the input source that is selected by the Input selector; this selection is fixed if the REC key is pressed on the corresponding deck as indicated by the "REC OUT A" or "REC OUT B" indicator blinking. Starting Computer CD Recording causes the REC OUT B selector to be set to select the CD, leaving the REC OUT A selector setting unchanged. During normal dubbing, all the switches of both the REC OUT A and B selectors are open.

Note 6 : The REC OUT A and/or B indicator being off indicates that the corresponding selector is open.

Note 7 : The "IDRS" indicator is lighted whenever the REC OUT A and B select different components.

- **Volume Control Keys (VOLUME UP/DOWN, BALANCE LEFT/RIGHT, and MUTING)**

The keys in this category control the L- and/or R-channel sound levels in various modes within a range between 0 and –78dB (–∞).

Pressing the VOLUME UP and DOWN key respectively increases both the L- and R-channel volumes in steps of 2dB and numerically displays the new setting (the larger of the L- and R-channel volume dB values) in a form of – NN dB in the Input Selector indicator area for approximately 3s, where each N is a digit.

Note 8 : When the L- and/or R-channel volume setting is updated, data representing both the new dB values are normally transferred to the Volume Controller IC, once for each channel. However, pressing the VOLUME UP key at an indication of 0dB or the VOLUME DOWN key at –78dB (–∞) causes no data transfer but only the same volume value indication is repeated.

The 11-point volume indicator on the FIP panel gives a continuous and visualized display of the volume value to aid you to quickly find an approximate setting as contrasting with the numerical displays described above. **Table 1** (page 10) lists the correspondence between the 11-point indications and dB values.

Pressing either key for not longer than approximately half a second causes a volume variation of a single 2dB step. Keeping to press it for longer than that period of time causes successive 2dB-step variations at a faster rate.

CIRCUIT DESCRIPTION

Volume dB value	11-point indication
0	11
– 2~– 4	10
– 6~–10	9
–12~–16	8
–18~–24	7
–26~–32	6
–34~–42	5
–44~–52	4
–54~–64	3
–66~–76	2
–78 (–∞)	1

Table 1 Correspondence between 11-point indications and dB representations

The BALANCE LEFT and RIGHT keys allow you to vary the volume balance between the L- and R-channels in steps of 2dB. The BALANCE LEFT key increases the balance L–R while the BALANCE RIGHT key decreases that balance or increase the balance R–L. A fast-rate balance variation feature can be in effect similarly to the fast-rate UP/DOWN mode with the VOLUME UP/DOWN key.

When the volume balance setting is updated, the new balance position is indicated by the balance indicator (for approximately 3s when either tape deck is recording) and data representing the new L- and R-channel volume values are transferred to the Volume Controller IC, once for each channel. However, pressing the BALANCE LEFT key with the leftmost balance position indicated or the BALANCE RIGHT key with the rightmost balance position indicated causes no data transfer and the balance indication remains unchanged. **Fig. 1** illustrates how to translate the balance indications to the corresponding dB representations.

The MUTING key alternately turns muting ON and OFF. When muting is ON as indicated by the "MUTING" indicator blinking, both the L- and R-channel volumes are decreased by 20dB (would be clampted to the bottom limit of –78dB if exceeded). Turning muting OFF by pressing the MUTING key again restores the original volume settings, turning the "MUTING" indicator off.

Note 9 : The volume control keys are always effective regardless of Roulette Play mode.

Note 10 : The actual data transferred to the Volume Controller IC is the indicated dB value corrected for the balance point and, if appropriate, the muting attenuation.

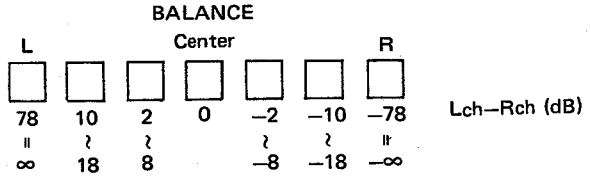


Fig. 1 Translation of balance indications to the corresponding to dB value

- **ROULETTE PLAY key**

This key alternately enables and disables a Roulette Play mode. When the mode is enabled, the "ROULETTE" indicator is lighted.

Enabling Roulette Play initiates a process of randomly selecting the input source from the tape decks A and B, CD, and PHONO. This process, which is indicated by the component name indicators lighted in turn, causes the REC OUT A and B selectors to follow the random Input Selector switching. If the volume settings were updated just before the ROULETTE PLAY key is pressed, the process would be delayed approximately 3s in which duration the new dB value would be indicated. Approximately 16s after the process is initiated, the amplifier displays the selected component, simultaneously issues a specific synchronizing code to that component, and then waits for a response. If no response is received within another interval of 16s, the amplifier attempts to select another component, assuming that the previous one is not connected (no further selection is made to it). When responses are received from two or more components. A difference component will be selected in each subsequent "random" selection. When only one component responds, that component will be repeatedly selected.

Note 11 : The ROULETTE PLAY key is effective only when neither deck A nor B is recording or auto-biased.

Note 12 : The random selection requires approximately 16s only for the first selection. Each subsequent selection requires 3s.

1–2. Test Mode

The amplifier is put in a test mode by shorting the test point to the ground line. In this mode, the VOLUME UP/DOWN key varies the volume in three steps : –∞ , –26dB, and –10dB. The BALANCE LEFT/RIGHT key selects only three balance positions; the leftmost end position, center, and rightmost end position.

Turning on the amplifier in test mode turns all the FIP panel indicators on. Pressing any key in this state restores the normal display.

1–3. Amplifier Status Backing-Up

The volume dB value, balance-point, and muting are backed up.

When the backed-up data are list, the amplifier is initialized to a volume of –50dB, the center balance position, and the muting and disabled state.

CIRCUIT DESCRIPTION

2. Key Switch and Synchronizing Code Functions

Sel1 = INPUT MONITOR SELECTOR
Sel2 = REC OUT A SELECTOR
Sel3 = REC OUT B SELECTOR

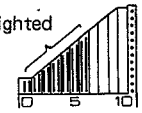
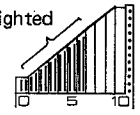
2–1. Input Keys

	Input key	Function	Display	Remarks
Selector key	PHONO	1. When ROULETTE indicator is OFF. • Sets Sel1 to select PHONO. • If deck B is not recording, sets Sel3 to select PHONO. • If deck A is not recording, sets Sel2 to select PHONO. 2. When ROULETTE indicator is ON. • Has no effect.	Character display area PHONO • The line connecting PHONO indicator to REC OUT B cassette symbol is lighted. • The line connecting PHONO indicator to REC OUT A cassette symbol is lighted.	• SEL PHONO output code is issued. • Sel3 remains unchanged if deck B is recording. • Sel2 remains unchanged if deck A is recoding.
	CD	1. When ROULETTE indicator is OFF. • Sets Sel1 to select CD. • If deck B is not recording, sets Sel3 to select CD. • If deck A is not recording, sets Sel2 to select CD. 2. When ROULETTE indicator is ON. • Has no effect	Character display area CD • The line connecting CD indicator to REC OUT B cassette symbol is lighted. • The line connecting CD indicator to REC OUT A cassette symbol is lighted.	• SEL CD output code is issued. • Sel3 remains unchanged if deck B is recording. • Sel2 remains unchanged if deck A is recording.
	TUNER	1. When ROULETTE indicator is OFF. • Sets Sel1 to select TUNER. • If deck B is not recording, sets Sel3 to select TUNER. • If deck A is not recording, sets Sel2 to select TUNER. 2. When ROULETTE indicator is ON. • Has no effect.	Character display area TUNER • The line connecting TUNER indicator to REC OUT B cassette symbol is lighted. • The line connecting TUNER indicator to REC OUT A cassette symbol is lighted.	• SEL TUNER output code is issued. • Sel3 remains unchanged if deck B is recording. • Sel2 remians unchanged if deck A is recording.
	TAPE-A	1. When ROULETTE indicator is OFF. • Sets Sel1 to TAPE-A. • If neither deck B is recording nor deck A is recording from deck B, sets Sel3 to select TAPE-A. • If deck A is not recording, makes Sel2 open (no input source connected to TAPE-A). 2. When ROULETTE indicator is ON. • Has no effect.	Character display area [A] TAPE • The line connecting TAPE-A indicator to REC OUT B cassette symbol is lighted. • No line to REC OUT A cassette symbol is lighted.	• SEL TAPE-A output code is issued. • Sel3 remains unchanged if deck B is recording. • Sel2 remains unchanged if deck A is recording.

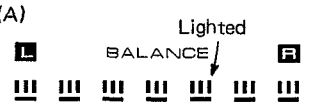
CIRCUIT DESCRIPTION

	Input key	Function	Display	Remarks
Selector key	TAPE-B	1. When ROULETTE indicator is OFF. • Sets Sel1 to select TAPE-B. • If deck B is not recording, makes Sel3 open (no input source connected to deck B). • If neither deck A is recording nor deck B is recording from deck A, sets Sel2 to select TAPE-B. 2. When ROULETTE indicator is ON. • Has no effect.	Character display area [B] TAPE • The line connecting TAPE-B indicator to REC OUT A cassette symbol is lighted. • No line to REC OUT B cassette symbol is lighted.	• SEL TAPE-B output code is issued. • Sel3 remains unchanged if deck B is recording. • Sel2 remains unchanged if deck A is recording.
	VIDEO	1. When ROULETTE indicator is OFF. • Sets Sel1 to select VIDEO. • If deck B is not recording, sets Sel3 to select VIDEO. • If deck A is not recording, sets Sel2 to select VIDEO.	Character display area VIDEO • The line connecting VIDEO indicator to REC OUT B cassette symbol is lighted. • The line connecting VIDEO indicator to REC OUT A cassette symbol is lighted.	• SEL AUX output code is issued. • Sel3 remains unchanged if deck B is recording. • Sel2 remains unchanged if deck A is recording.
	ROULETTE	1. When ROULETTE indicator is OFF. • If neither deck A nor B is recording (recording includes tape-to-tape dubbing and bias adjustment), starts Roulette Play, turning ROULETTE indicator ON. 2. When ROULETTE indicator is ON. • Stops Roulette Play, turning ROULETTE indicator OFF.	[ROULETTE] indicator is turned on. [ROULETTE] indicator is turned off.	• ROULETTE ON output code is issued. • ROULETTE OFF output code is issued.
	MUTE	1. When MUTING indicator is OFF. • Mutes the amplifier (by −20dB), turning MUTING indicator ON. 2. When MUTING indicator is ON. • Disables muting, turning MUTING indicator OFF.	MUTING indicator is blinking. MUTING indicator is turned off.	

CIRCUIT DESCRIPTION

	Input key	Function	Display	Remarks
	VOLUME UP	1. When pressed for not longer than about 0.5sec., • Increases L- and R-channel volumes by a 2dB step (the maximum limit is 0dB). 2. When continuously pressed for longer than about 0.5 sec., • Repeats to increase L- and R-channel volumes in 2dB steps about every 0.12 sec. as long as pressed in excess of about 0.5 sec. (the maximum limit is 0dB).	• 11-point volume indicator Lighted  • Character display area (when Sel1 = PHONO only) PHONO ↓ When VOLUME UP key is pressed -20dB ↓ About 3 sec. later PHONO • The indicated numeric dB value represents the larger of the current L- and R-channel volumes.	
	VOLUME DOWN	1. When pressed for not longer than about 0.5 sec., • Decreases L- and R-channel volumes by a 2dB step (the minimum limit is —78dB). 2. When continuously pressed for longer than about 0.5 sec., • Repeats to decrease L- and R-channel volumes in 2dB steps about every 0.12 sec. as long as pressed in excess of about 0.5 sec. (the minimum limit is —78dB). • When the minimum limit of —78dB is reached, mutes the amplifier.	• 11-point volume indicator Lighted  • Character display area (when Sel1 = PHONO only). PHONO ↓ When VOLUME DOWN key is pressed -20dB ↓ About 3 sec. later PHONO • The indicated numeric dB value represents the larger of the current L- and R-channel volumes.	
	BALANCE LEFT	1. When pressed for not longer than about 0.5sec., • Decreases R-channel volume by a 2dB step (the minimum limit is —78dB). 2. When continuously pressed for longer than about 0.5sec., • Repeats to decrease R-channel volume in 2dB steps about every 0.3 sec. as long as pressed in excess of about 0.5 sec. (the minimum limit is —78dB).	• When neither deck A nor B is recording : (A) Lighted • Other than above : (B) Lighted and not lighted marks change about every 0.25 sec. Lighted when both decks A and B are recording. • When BALANCE LEFT key is pressed The indication s change from (B) to (A) when pressed and return to (B) about 3 sec. later.	

CIRCUIT DESCRIPTION

	Input key	Function	Display	Remarks
	BALANCE RIGHT	1. When pressed for not longer than about 0.5 sec., • Decreases L-channel volume by a 2dB step (the minimum limit is –78 dB). 2. When continuously pressed for longer than about 0.5 sec., • Repeats to decrease L-channel volume in 2dB steps about every 0.3 sec. as long as pressed in excess of about 0.5 sec. (the minimum limit is –78dB).	• When neither deck A nor B is recording : (A)  • Other than above : (A) Same as with BALANCE LEFT key.	
	POWER (RESET signal input)	1. When power is OFF. • Sets Sel1, SEI2, and Sel3 to select TUNER. • Causes a check to be made to find whether the amplifier is in back-up mode and, if it is, restores the previous amplifier status. If the amplifier is not in back-up mode, initializes its status; e.g., sets the L- and R-channel volumes to –50dB. • Disables Roulette Play, turning ROULETTE indicator OFF. • Turns amplifier ON with MUTING enabled. Muting is disabled about 4 sec. later. 2. When power is ON. • Turns amplifier OFF, putting it in back-up mode.	• 11-point volume indicator blinks	• POWER ON output code is issued. • ROULETTE output code is issued. • SEL TUNER output code is issued.

2–2. Synchronizing Codes from System Components

	Synchronizing code	Function	Display	Remarks
From tuner	TUNER PLAY	• Sets Sel1 to select TUNER. • If deck B is not recording, sets Sel3 to select TUNER. • If deck A is not recording, sets Sel2 to select TUNER.	Character display area 	• Same as when TUNER selector key is pressed with ROULETTE OFF. • SEL TUNER output code is issued when TUNER is actually selected.
	Remote Control key OFF	• If VOLUME UP/DOWN or BALANCE LEFT/RIGHT operation is in progress, disables Remove Control keys. Remote		
From turntable	PLAYER PLAY	• Sets Sel1 to select PHONO. • If deck B is not recording, sets Sel3to select PHONO. • If deck A is not recording, sets Sel2 to select PHONO. • While in Roulette Play mode, the amplifier assumes that the player is powered if no "Player PLAY" code is returned from the player within 16 sec. after it issued a "SEL PHONO".	Character display area 	• SEL PHONO output code is issued. • Same as when PHONO selector key is pressed with ROULETTE OFF.

CIRCUIT DESCRIPTION

	Synchronizng code	Function	Display	Remarks
From turntable	PLAYER STOP	1. When ROULETTE indicator is OFF. • Has no effect. 2. When ROULETTE indicator is ON. • Randomly selects CD or TAPE-B for input source and resets Sel1, Sel2 and Sel3 accordingly.		• SEL XXXX output code is issued where XXXX is the randomly selected component name.
From CD	CD PLAY	1. When ROULETTE indicator is OFF. • Sets Sel1 to select CD. • If deck B is not reocording, sets Sel3 to select CD. • IF deck A is not recording, sets Sel2 to select CD. 2. When ROULETTE indicator is ON. • The amplifier assumes that the CD is not powered if no "CD PLAY" code is returned within 16 sec. after it issued a "SEL CD".	Character display area CD	• SEL CD output code is issued when CD is actually selected. • The effect is the same as when CD selector key is pressed with ROULETTE OFF.
	CD STOP	1. When ROULETTE indicator is OFF. • Has no effect. 2. When ROULETTE indicator is ON. • Randomly selects Player (PHONO) or TAPE-B, setting Sel1, Sel2, and Sel3 accordingly.		• SEL XXXX output code is issued where XXXX is the randomly selected component name.
	CD ON	1. When ROULETTE indicator is OFF. • Disables Computer CD recording. 2. When ROULETTE indicator is ON. • Stops Roulette Play, turning ROULETTE indicator OFF.		
From A deck	A DECK PLAY	1. When ROULETTE indicator is OFF. • Changes deck A to a "non-recording" state. • Sets Sel1 to select TAPE-A. • If deck B is not recording, sets Sel3 to select TAPE-A. • Makes Sel2 open (no input source connected to deck A). 2. When ROULETTE indicator is ON. • Has no effect.	Character display area [A] TAPE • REC OUT A stops blinking.	• SEL TAPE-A output code issued when TAPE-A is actually selected.
	A DECK STOP	1. When ROULETTE indicator is OFF. • Changes deck A to a "non-recording" state. • Sets Sel2 equal to Sel1 (Sel2 is made open when Sel1 is set to select TAPE-A). 2. When ROULETTE indicator is ON. • Has no effect.	• REC OUT A stops blinking.	

CIRCUIT DESCRIPTION

	Synchronizing code	Function	Display	Remarks
From A deck	A DECK PHONO REC	1. When ROULETTE indicator is OFF. • Puts deck A in "recording" state. • Sets Sel2 to select PHONO. 2. When ROULETTE indicator is ON. • Has no effect.	The line connecting PHONO indicator to REC OUT A cassette symbol is blinking.	
	A DECK CD REC	1. When ROULETTE indicator is OFF. • Puts deck A in "recording" state • Sets Sel2 to select CD. 2. When ROULETTE indicator is OFF. • Has no effect.	• The line connecting CD indicator to REC OUT A cassette symbol is blinking.	
	A DECK TUNER REC	1. When ROULETTE indicator is OFF. • Puts deck A in "recording" state. • Sets Sel2 to select TUNER. 2. When ROULETTE indicator is ON. • Has no effect.	• The line connecting TUNER indicator to REC OUT A cassette symbol is blinking	
	A DECK AUX REC	1. When ROULETTE indicator is OFF. • Puts deck A in "recording" state • Sets Sel2 to select VIDEO. 2. When ROULETTE indicator is ON. • Has no effect.	The line connecting VIDEO indicator to REC OUT A cassette symbol is blinking	
	A DECK ON	1. When ROULETTE indicator is OFF. • Changes deck A and B to a "non-recording" state. 2. When ROULETTE indicator is ON. • Stops Roulette Play, turning ROULETTE indicator OFF.		
	A DECK TAPE-B REC	1. When ROULETTE indicator is OFF. • If deck B is not recording and Sel3 is set to select other than TAPE-A, sets Sel2 to select TAPE-B. • Puts deck A in "recording" state. 2. When ROULETTE indicator is ON. • Has no effect.	• The line connecting TAPE-B indicator to REC OUT A cassette symbol is blinking.	No operation is made if deck B is recording or Sel3 is set to select TAPE-A.

CIRCUIT DESCRIPTION

	Synchronizing code	Function	Display	Remarks
Form B deck	B DECK PLAY	1. When ROULETTE indicator is OFF. • Puts deck B to a "non-recording" state. • Sets Sel1 to select TAPE-B. • If deck A is not recording, sets Sel2 to select TAPE-B. • Makes Sel3 open (no input source connected to TAPE-B). • Disables Computer CD Recording. 2. When ROULETTE indicator is ON. • The amplifier assumes that deck B is not powered if no "B DECK PLAY" code is returned within about 10 sec. after it issued a "SEL TAPE-B".	Character display area [B] TAPE • REC OUT B stops blinking.	• SEL TAPE-B output code is issued when TAPE-B selection is established.
	B DECK STOP	1. When ROULETTE indicator is OFF. • Forces deck B to a "non-recording" state. • Sets Sel3 equal to Sel1 (makes Sel3 open if Sel1 is set to select TAPE-B). • Disables Computer CD Recording. 2. When ROULETTE indicator is ON. • Initiates random selection and sets Sel2 and Sel3 equal to Sel1 after it selected a component.		• SEL XXXX output code is issued where XXXX is the randomly selected compo-ponent name.
	B DECK PHONO REC	1. When ROULETTE indicator is OFF. • Puts deck B in "recording" state. • Sets Sel3 to select PHONO. 2. When ROULETTE indicator is ON. • Has no effect.	• The line connecting PHONO indicator to REC OUT B cassette symbol is blinking.	
	B DECK CD REC	1. When ROULETTE indicator is OFF. • Puts deck B in "recording" state. • Sets Sel3 to select CD. 2. When ROULETTE indicator is ON. • Has no effect.	• The line connecting CD indicator to REC OUT B cassette symbol is blinking.	
	B DECK TUNER REC	1. When ROULETTE indicator is OFF. • Puts deck B in "recording" state. • Sets Sel3 to select TUNER. 2. When ROULETTE indicator is ON. • Has no effect.	• The line connecting TUNER indicator to REC OUT B cassette symbol is blinking.	

CIRCUIT DESCRIPTION

	Synchronizing code	Function	Display	Remarks
From B deck	B DECK AUX REC	1. When ROULETTE indicator is OFF. • Puts deck B in "recording" state. • Sets Sel3 to select VIDEO. 2. When ROULETTE indicator is ON. • Has no effect.	• The line connecting VIDEO indicator to REC OUT B cassette symbol is blinking.	
	B DECK TAPE-A REC	1. When ROULETTE indicator is OFF. • If deck A is not recording nor Sel2 is set to select TAPE-B, sets Sel3 to select TAPE-A. • Puts deck B in "recording" state. 2. When ROULETTE indicator is ON. • Has no effect.	• The line connecting TAPE-A indicator to REC OUT B cassette symbol is blinking.	
	CCD REC START	1. When Computer CD recording disabled. • Puts deck B in Computer CD recording state. 2. When Computer CD recording. enabled. • Has no effect.		
	DUBBING	• Makes Sel2 and Sel3 open and puts deck B in "recording" state.		
	BIAS	• Disables Roulette Play.		

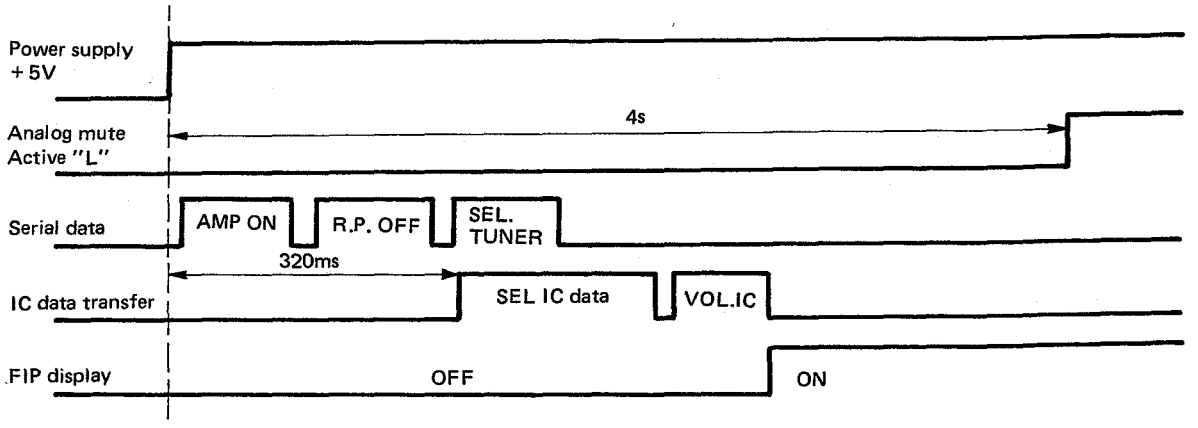
2–3. Test Mode

	Input key	Function	Display	Remarks
	ROULETTE and MUTE select key	• Same as normal mode.		
	VOLUME UP	• Increases L- and R-channel volumes in three steps of –78dB (minimum), –26dB (center), and 0dB (maximum).		
	VOLUME DOWN	• Decreases L- and R-channel volumes in three steps of 0dB (maximum), –26dB (center), and –78dB (minimum).		
	BALANCE LEFT	• Varies balance between L- and R-channel volumes from 0 to 78dB.		
	BALANCE RIGHT	• Varies balance between L- and R-channel volumes from 0 to –78dB.		
	POWER	1. When power is OFF. • Turn the amplifier ON and lights all FIP indicators and segments. • Pressing any key in this state restores normal indications. • Same as normal mode except for above.		• POWER ON output code is issued. • ROULETTE OFF output code is issued. • SEL TUNER output code is issued.

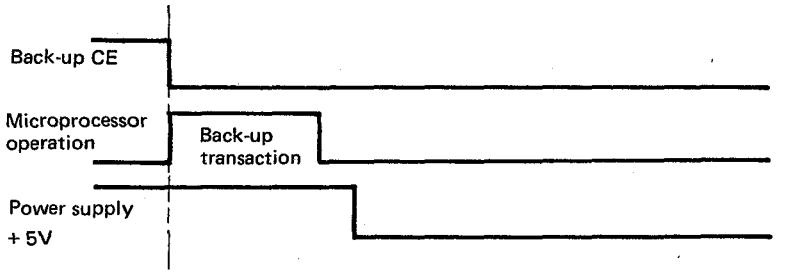
CIRCUIT DESCRIPTION

4. Timing Diagrams

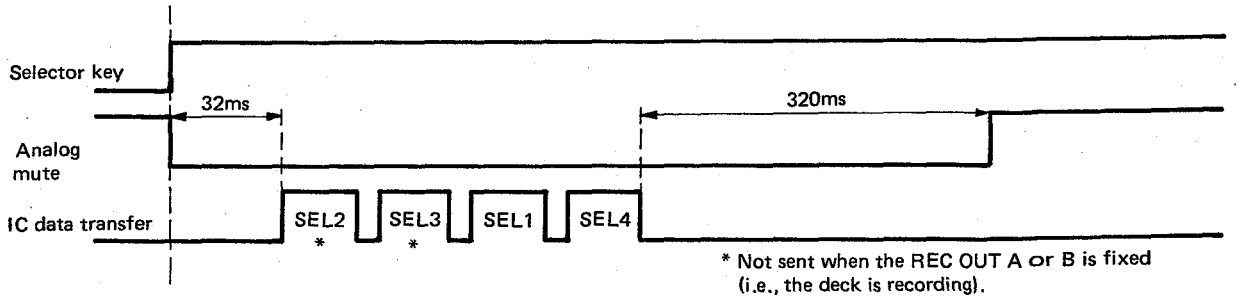
4–1. Power ON



4–2. Power OFF



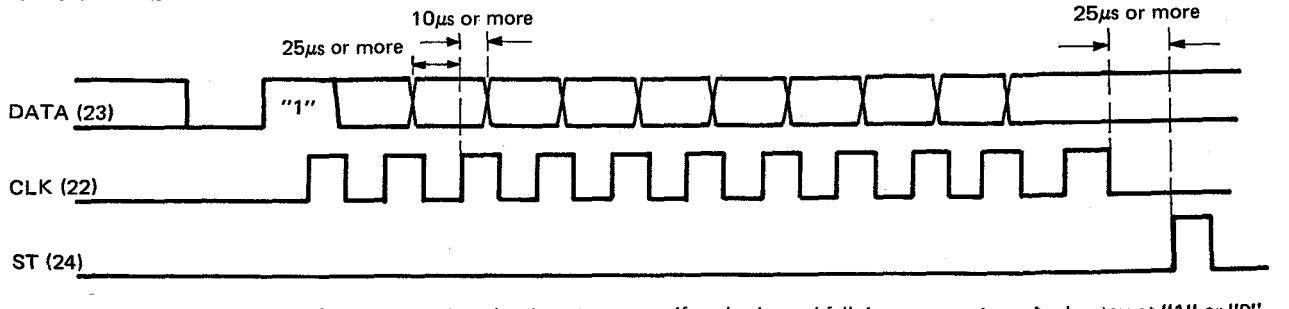
4–3. When the selector key is depressed



* Not sent when the REC OUT A or B is fixed (i.e., the deck is recording).

4–4. When the VOLUME, BALANCE, MUTE key is depressed

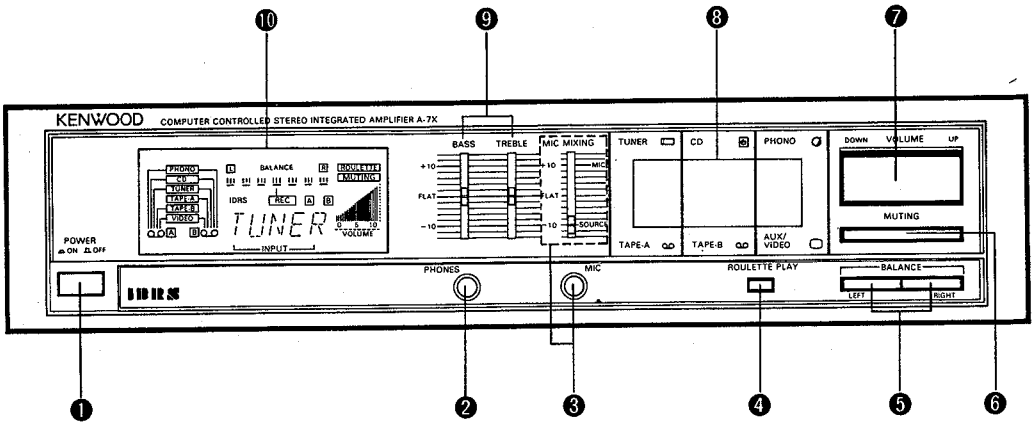
4–5. IC transfer data



Actually, the data signal may not so uniformly rise and fall; it may more irregularly stay at "1" or "0". The final data signal state may be "1" or "0" depending on the last bit (LSB) value.

CIRCUIT DESCRIPTION

Function of amplifier



❶ POWER switch

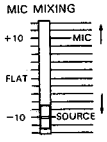
Press the POWER switch to turn on power.
Press it again to turn power off.

❷ PHONES jack

Connect a stereo headphone plug to this jack.
The sound from the speakers are automatically cut. Turn down the volume before connection or removal of headphones.

❸ MIC jack/MIC MIXING control knob

Connect the microphone jack to a monaural microphone.



Raise the knob to decrease the source and increase the microphone level.

Lower the knob to decrease the microphone and increase the source level.

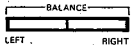
When a microphone is not used, be sure to set the knob to the SOURCE position and unplug the microphone. Before plugging or unplugging the microphone, be sure to set the mixing level control knob to the SOURCE position and lower the volume level with the VOLUME key.

❹ ROULETTE PLAY switch

Selects and plays the source input at random when pressed.
Press the switch again to release.
INPUT does not function until roulette play is released.
This switch should be ON only when roulette play is needed.

❺ BALANCE control knob

Controls sound balance for both speakers.



Press LEFT to decrease the right-channel volume level and press RIGHT to decrease the left-channel volume level.

❻ MUTING switch

One touch reduces the volume and another touch restores the volume.

❼ VOLUME key

Controls the volume to the speakers and headphones.
Turn down the volume before turning off the power switch.

Note:

The volume level when the POWER switch is turned OFF is backed up by the non-operation power so long as the power plug is connected to the AC outlet.
However, when the power is interrupted or when the power plug is unplugged from the AC outlet, the volume is automatically set to the lower level.

❽ Input mode switch

TUNER : Press to listen to the tuner.
CD : Press to listen to the CD Player.
PHONO : Press to listen to the player.
AUX/VIDEO : Press to listen to the program source which is connected to an AUX/VIDEO terminal.
TAPE-A : Press to listen to the cassette deck A.
TAPE-B : Press to listen to the cassette deck B.

Note:

These input mode select keys switch the input mode as well as the TAPE A and TAPE B record modes simultaneously except when recording is performed on the A deck or B deck. When recording is required, be sure to confirm that the record mode indicator is set to the desired source position.

❾ Tone control knob

Adjust the tone to the environment or speakers.

↑ High tone accentuates
TREBLE
↓ High tone attenuates

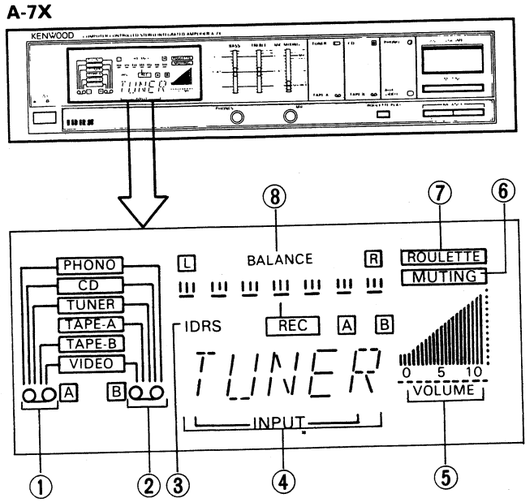
↑ Low tone accentuates
BASS
↓ Low tone attenuates

❿ Display window

CIRCUIT DESCRIPTION

Display window

A-7X



① TAPE-A REC mode indicator

The indicator lights to show the source to be recorded onto A deck of the cassette deck, and blinks while recording.

② TAPE-B REC mode indicator

The indicator lights to show the source to be recorded onto B deck of the cassette deck, and blinks while recording.

③ IDRS indicator

This indicator lights when different sources are recorded onto A deck and B deck.

④ INPUT mode indicator

This display shows the name of the program source currently heard from the speakers.

⑤ VOLUME indicator

The volume level is shown by the 11-step pictorial display and the exact level is displayed in dB in the character display window (INPUT mode indicator window) by each step.

⑥ MUTING indicator

This indicator lights when the MUTING switch is pressed.

⑦ ROULETTE indicator

This indicator lights when Roulette play is engaged.

⑧ BALANCE indicator

This indicator shows the volume balance between the L (left) channel and the R (right) channel.

Input source for listening, the program sources, to be recorded with A and B cassette decks can be selected individually.

"Roulette play" is the function for amusement

- With this function, tunes contained in the units with which the roulette play is possible (see below) are randomly selected by the incorporated microcomputer and played sequentially; suitable for long-time weary-free listening or background music.

Units compatible with Roulette Play

- Turntable: P-7X (optional)
- Cassette deck: X-7WX (B deck)
- Compact disc player: DP-770D (Optional)

Roulette Play Operations

1 Load a compact disc, cassette tape and a record on the relevant units.
Set the direction mode switch on the cassette deck to the desired position.

2 Press the ROULETTE PLAY switch on the amplifier (A-7X).
When the ROULETTE PLAY switch is pressed, the character display section of the display window is changed rapidly to show that the system enters the roulette play mode.

3 To release the roulette play, press the ROULETTE PLAY switch again.

Notes:

1. The roulette play does not function when the cassette deck is in the record mode.
2. During the roulette play, when the STOP key on the currently playing source unit is pressed, the playing source is changed to the next selection and roulette play is continued.
3. During roulette play, no operation keys are effective other than the STOP key (PLAY/CUT key for the turntable, and PLAY/❚❚ PAUSE key).
4. When the program source is not loaded on the selected unit, another source unit will be selected.
5. During roulette play, the INPUT selector on the amplifier does not function. When using the INPUT selector, be sure to confirm that the ROULETTE PLAY indicator is not lit.

ADJUSTMENT/REGLAGE/ABGLEICH

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
Set the controls and switches as follows: POWER: ON							
1	IDLE CURRENT (5~100mA)	–	Connect a DC voltmeter to CP1 (L) CP2 (R)	VOLUME: 0	R17,23 (L) R20,24 (R)	* 2.2mV~44mV	(a)

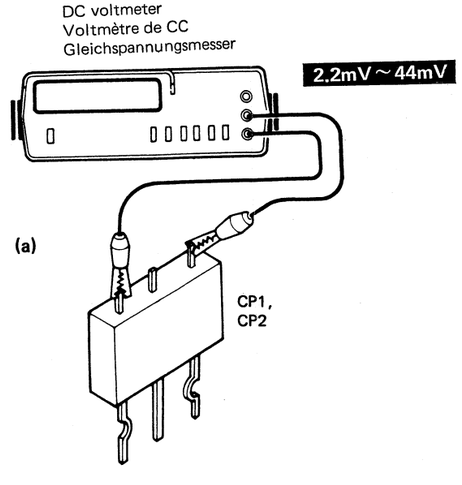
*
- When it is too high, cut R17(R20) off.
- When it is too low, cut R23(R24) off.

N°	ITEM	REGLAGE DE L' ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L' AMPLIFICATEUR	POINS L' ALIGNEMENT	ALIGNER POUR	FIG.
Régler les controles et boutons comme suit: POWER: ON							
1	COURANT DE POLARISATION (5~100mA)	–	Raccorder un voltmètre CC à CP1 (G) CP2 (D)	VOLUME: 0	R17.23 (G) R20.24 (D)	* 2,2mV~44mV	(a)

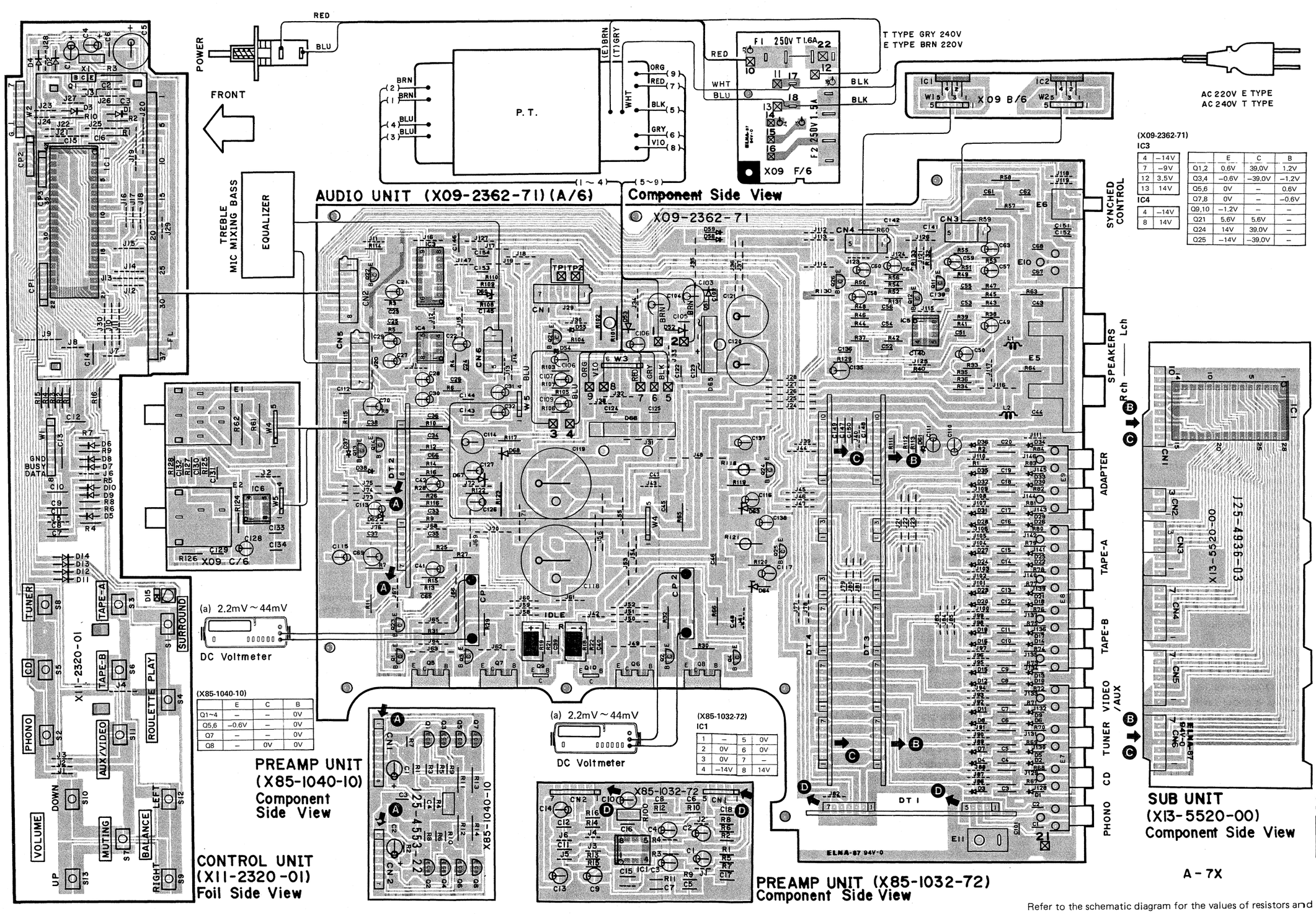
*
- Quand il est trop haut, couper R17(R20).
- Quand il est trop bas, couper R23(R24).

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
Die Regler und Knöpfe wird folgt einstellen: POWER: ON							
1	LEERLAUFSTROM (5~100mA)	–	Ein Gleichstrom-Voltmeter an CP1 (L) CP2 (R) anschließen.	VOLUME: 0	R17.23 (L) R20.24 (R)	* 2,2mV~44mV	(a)

*
- Wenn zu hoch, R17(R20) verringern.
- Wenn zu niedrig, R23(R24) verringern.



PC BOARD



(X09-2362-71)

IC3

4	−14V
7	−9V
12	3.5V
13	14V

IC4

4	−14V
8	14V

	E	C	B
Q1,2	0.6V	39.0V	1.2V
Q3,4	−0.6V	−39.0V	−1.2V
Q5,6	0V	–	0.6V
Q7,8	0V	–	−0.6V
Q9,10	−1.2V	–	–
Q21	5.6V	5.6V	–
Q24	14V	39.0V	–
Q25	−14V	−39.0V	–

(X85-1040-10)

	E	C	B
Q1~4	–	–	0V
Q5,6	−0.6V	–	0V
Q7	–	–	0V
Q8	–	0V	0V

(X85-1032-72)

IC1

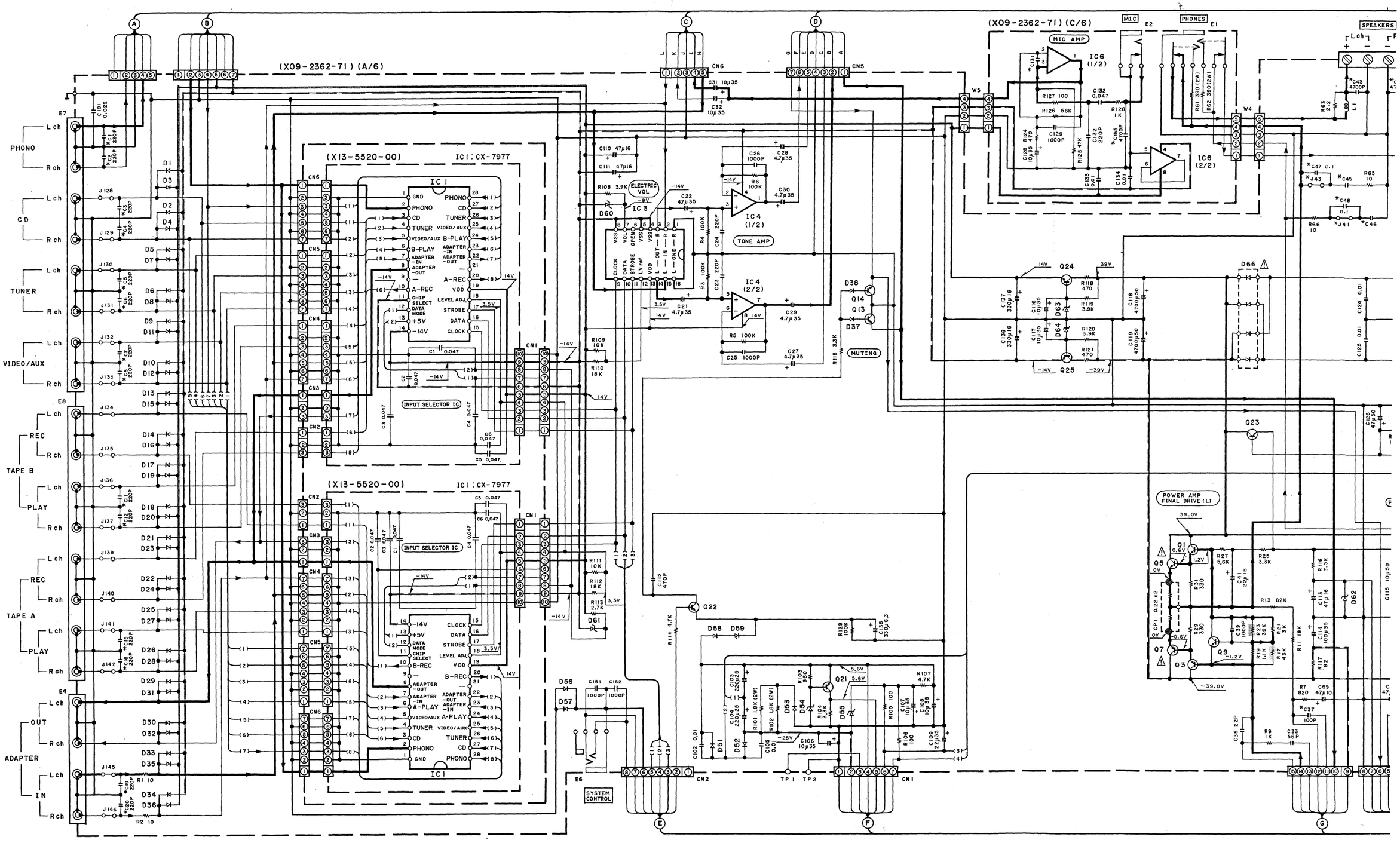
1	–	5	0V
2	0V	6	0V
3	0V	7	–
4	−14V	8	14V

(X13-5520-00)

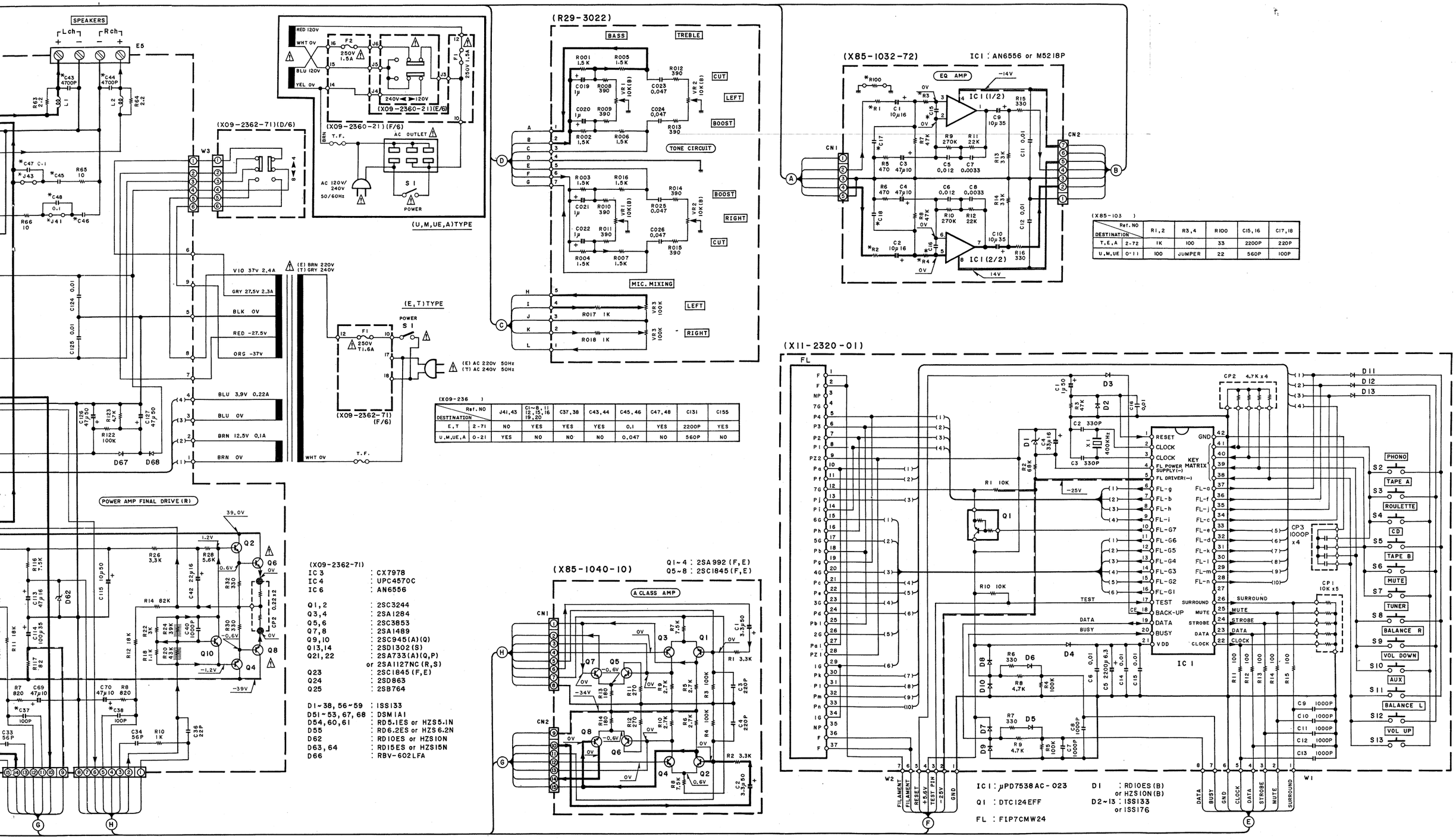
IC1

11	−14V
14	−14V
18	3.5V
19	14V

Refer to the schematic diagram for the values of resistors and capacitors.



2SA1127NC	2SC1845	2SA1489	2SC3853	DTC124EFF	CX7978	AN6556	μPD7538AC-023	CX7977
2SA1284	2SC3244					M5218P		
2SA733(A)	2SC945(A)					μPC4570C		
2SA992	2SD1302							
2SB764	2SD863							



(X85-103) Ref. NO / DESTINATION	R1,2	R3,4	R100	C15,16	C17,18
T,E,A 2-72	1K	100	33	2200P	220P
U,M,UE 0-11	100	JUMPER	22	560P	100P

(X09-236) Ref. NO / DESTINATION	J41,43	C1~8, 11, 12, 15, 16, 19, 20	C37,38	C43,44	C45,46	C47,48	C131	C155
E,T 2-71	NO	YES	YES	YES	0.1	YES	2200P	YES
U,M,UE,A 0-21	YES	NO	NO	NO	0.047	NO	560P	NO

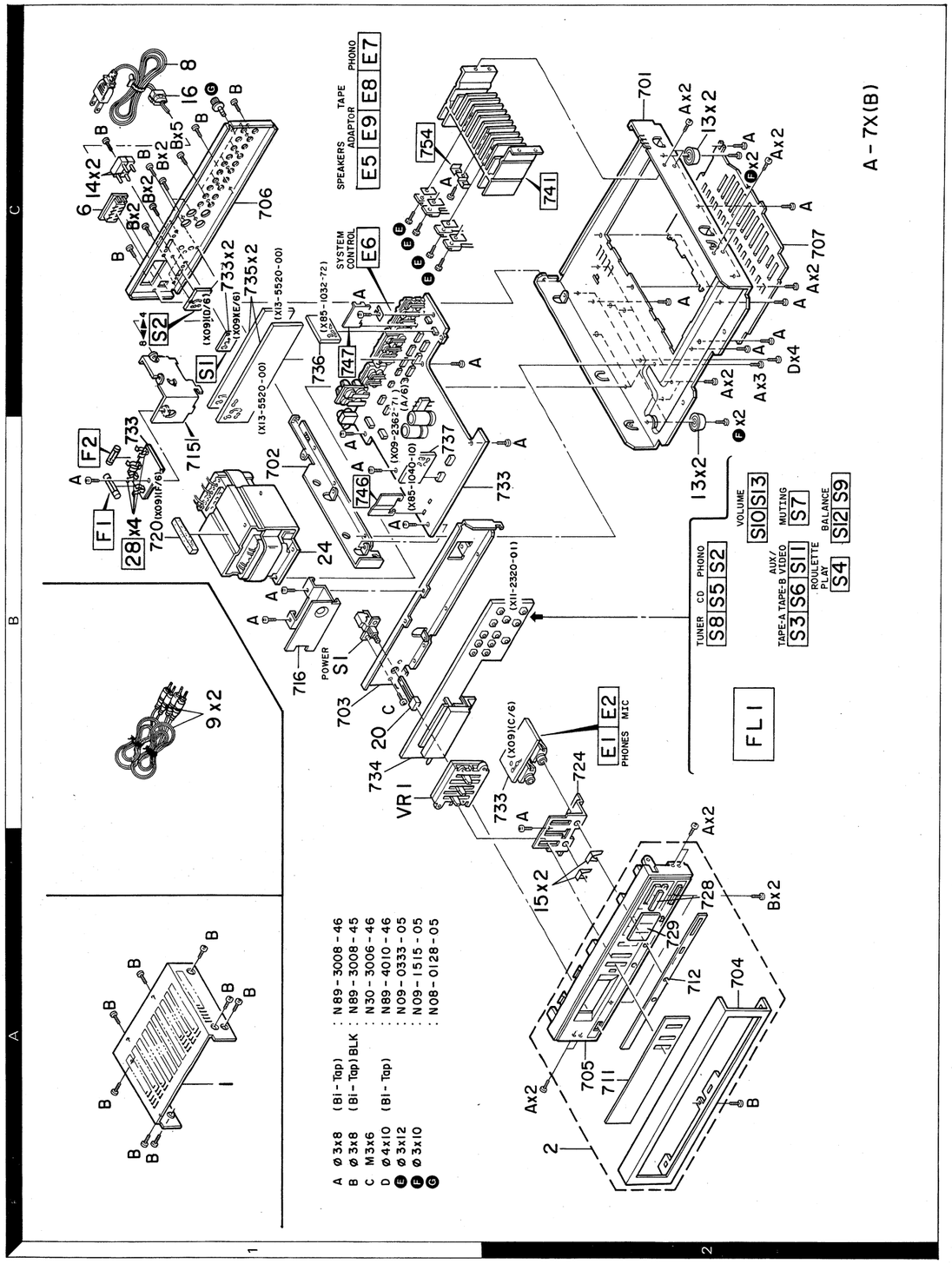
- DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

A-7X

KENWOOD

EXPLODED VIEW



Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

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	Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
				A-7X			
	1	1A	*	A01-1518-01	METALLIC CABINET		
	2	2A	*	A20-5006-02	PANEL ASSY	T	
	2	2A	*	A20-5099-02	PANEL ASSY	UMUEEA	
	-			B46-0094-03	WARRANTY CARD	UUE	
	-			B46-0095-03	WARRANTY CARD	UUE	
	-			B46-0122-13	WARRANTY CARD	E	
	-			B46-0123-03	WARRANTY CARD	T	
	-		*	B50-6437-00	INSTRUCTION MANUAL(ENGLISH)	UMUEEA	
	-		*	B50-6438-00	INSTRUCTION MANUAL(FRENCH)	MEA	
	-		*	B50-6439-00	INSTRUCTION MANUAL(SPANISH)	MA	
	-		*	B50-6440-00	INSTRUCTION MANUAL(ARABIC)	MA	
	-			B50-6441-00	INSTRUCTION MANUAL(ENGLISH)	T	
	-			B50-6442-00	INSTRUCTION MANUAL(G,D,I)	E	
	-		*	B52-0230-00	CONNECTING DIAGRAM		
	-			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
	-			B58-0513-04	CAUTION CARD (PRESET220-240)	UE	
	-			B58-0803-03	CAUTION CARD	E	
	-			B59-0092-00	SERVICE DIRECTORY	UUE	
⚠	6	1C		E03-0069-05	AC OUTLET	UMUE	
⚠	8	1C		E30-0459-05	AC POWER CORD	EA	
⚠	8	1C		E30-0812-05	AC POWER CORD	UMUE	
⚠	8	1C		E30-1416-05	AC POWER CORD	T	
	9	1B		E30-1392-05	CORD WITH PLUG		
	-		*	H01-7324-04	ITEM CARTON CASE	UMUEEA	
	-		*	H01-7381-04	ITEM CARTON CASE	T	
	-		*	H10-3365-02	POLYSTYRENE FOAMED FIXTURE		
	-		*	H10-3366-02	POLYSTYRENE FOAMED FIXTURE		
	-			H25-0148-04	PROTECTION BAG (110X230X0.07)		
	-			H25-0223-04	PROTECTION BAG (750X350)		
	-			H25-0232-04	PROTECTION BAG (235X350)		
	13	2B,2C		J02-0170-04	FOOT		
	14	1C		J12-0094-05	PIN		
	15	2A		J21-3326-05	JACK MOUNTING HARDWARE		
⚠	16	1C		J42-0083-05	POWER CORD BUSHING		
	-			J61-0307-05	WIRE BAND		
	20	1B	*	K29-2540-04	KNOB ASSY (POWER)		
	24	1B	*	L01-7392-05	POWER TRANSFORMER	E	
	24	1B	*	L01-7395-05	POWER TRANSFORMER	UMUEA	
	24	1B	*	L01-7397-05	POWER TRANSFORMER	T	
	F	2B,2C		N09-1515-05	TAPPING SCREW (Ø3X8)		
	G	1C		N08-0128-35	BINDING POST (GND)		
	VR1	1B	*	R29-3022-05	POTENTIOMETER (TONE,MIC MIXING		
⚠	S1	1B		S40-1073-05	PUSH SWITCH (POWER)		
				AUDIO UNIT (X09-2362-71)			
	C1 ,2			CC45FSL1H221J	CERAMIC 220PF J	TEA	
	C3 -8			C91-0749-05	CERAMIC 220PF K	TEA	
	C11 ,12			C91-0749-05	CERAMIC 220PF K	TEA	
	C15 ,16			C91-0749-05	CERAMIC 220PF K	TEA	
	C19 ,20			C91-0749-05	CERAMIC 220PF K	TEA	

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PARTS LIST

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C21 ,22			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C23 ,24			CC45FSL1H221J	CERAMIC 220PF J		
C25 ,26			CF92FV1H102J	MF 1000PF J		
C27 -30			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C31 ,32			CE04KW1V100M	ELECTRO 10UF 35WV		
C33 ,34			CC45FSL1H560J	CERAMIC 56PF J		
C35 ,36			CC45FSL1H220J	CERAMIC 22PF J		
C37 ,38			CC45FSL1H101J	CERAMIC 100PF J	TEA	
C39 ,40			C91-0757-05	CERAMIC 0.001UF K		
C41 ,42			CE04KW1C220M	ELECTRO 22UF 16WV		
C43 ,44			CK45FF1H472Z	CERAMIC 4700PF Z	TEA	
C45 -48			CF92FV1H104J	MF 0.10UF J	TEA	
C45 ,46			CK45FF1H473Z	CERAMIC 0.047UF Z	UMUE	
C69 ,70			CE04KW1A470M	ELECTRO 47UF 10WV		
C101			CK45FF1H223Z	CERAMIC 0.022UF Z		
C102			CK45FF1H103Z	CERAMIC 0.010UF Z		
C103,104			CE04KW1E221M	ELECTRO 220UF 25WV		
C105			CK45FF1H103Z	CERAMIC 0.010UF Z		
C106-108			CE04KW1V100M	ELECTRO 10UF 35WV		
C109			CE04KW1V220M	ELECTRO 22UF 35WV		
C110,111			CE04KW1C470M	ELECTRO 47UF 16WV		
C112			CK45FB1H471K	CERAMIC 470PF K		
C113			CE04KW1C470M	ELECTRO 47UF 16WV		
C114			CE04KW1H101M	ELECTRO 100UF 50WV		
C115			CE04KW1H100M	ELECTRO 10UF 50WV		
C116,117			CE04KW1V100M	ELECTRO 10UF 35WV		
C118,119			C90-0580-05	ELECTRO 4700UF 50WV		
C124,125			CK45FF1H103Z	CERAMIC 0.010UF Z		
C126,127			CE04KW1H470M	ELECTRO 47UF 50WV		
C128			CE04KW1V100M	ELECTRO 10UF 35WV		
C129			CK45FB1H102K	CERAMIC 1000PF K		
C130			CF92FV1H473J	MF 0.047UF J		
C131			CK45FB1H222K	CERAMIC 2200PF K	TEA	
C131			CK45FB1H561K	CERAMIC 560PF K	UMUE	
C132			CC45FSL1H221J	CERAMIC 220PF J		
C133,134			CK45FF1H103Z	CERAMIC 0.010UF Z		
C135			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C137,138			CE04KW1C331M	ELECTRO 330UF 16WV		
C143,144			CK45FF1H223Z	CERAMIC 0.022UF Z		
C145-150			C91-0769-05	CERAMIC 0.01UF M		
C151,152			C91-0757-05	CERAMIC 0.001UF K		
C153,154			CK45FF1H223Z	CERAMIC 0.022UF Z		
C155			C91-0765-05	CERAMIC 0.0047UF M		
C156			CK45FF1H103Z	CERAMIC 0.010UF Z	TEA	
C156			CK45FF1H473Z	CERAMIC 0.047UF Z	UMUE	
E1	2B		E11-0160-05	PHONE JACK (7P)PHONES		
E2	2B		E11-0159-05	PHONE JACK (3P)MIC		
E5	1C		E20-0451-05	LOCK TERMINAL BOARD(4P)SPEAKER		
E6	1C	*	E11-0165-05	MINIATURE PHONE JACK(SYS CONT)		
E7 ,8	1C		E13-0814-05	PHONO JACK (8P)PHONO,TUNER,ETC		
E9	1C		E13-0497-05	PHONO JACK (4P)ADAPTOR		
E11		*	E23-0149-05	TERMINAL		
⚠ F1	1B		F05-1623-05	FUSE (SEMKO) (250V T1.6A)	TEA	
⚠ F1 ,2	1B		F05-1521-05	FUSE (250V 1.5A)	UMUE	

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28	1B		J13-0055-05	FUSE CLIP		
L1 ,2			L39-0085-05	PHASE-COMPENSATION COIL		
E	1C		N09-0333-05	TAPPING SCREW (Ø3X12)		
CP1 ,2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R29 -32			RD14AB2E331J	FL-PROOF RD 330 J 1/4W		
R61 ,62		*	RS14DB3D391J	FL-PROOF RS 390 J 2W		
R63 ,64			RD14AB2E2R2J	FL-PROOF RD 2.2 J 1/4W		
R65 ,66			RS14DB3A100J	FL-PROOF RS 10 J 1W		
R101,102			RS14DB3D182J	FL-PROOF RS 1.8K J 2W		
R117			RD14AB2E820J	FL-PROOF RD 82 J 1/4W		
R118			RS14DB3A471J	FL-PROOF RS 470 J 1W		
R121			RS14DB3A471J	FL-PROOF RS 470 J 1W		
R123			RS14DB3D472J	FL-PROOF RS 4.7K J 2W		
⚠ S1	1C		S31-2083-05	SLIDE SWITCH (POWER TYPE)	UMUE	
S2	1C		S31-2113-05	SLIDE SWITCH (8OHM/4OHM)		
D1 -38			1SS133	DIODE		
D1 -38			1SS176	DIODE		
D51 -53			DSM1A1	DIODE		
D54			HZS5.1N(B2)	ZENER DIODE		
D54		*	RD5.1ES(B2)	ZENER DIODE		
D55			HZS6.2N(B2)	ZENER DIODE		
D55			RD6.2ES(B2)	ZENER DIODE		
D58 ,59			1SS133	DIODE		
D58 ,59			1SS176	DIODE		
D60 ,61			HZS5.1N(B2)	ZENER DIODE		
D60 ,61		*	RD5.1ES(B2)	ZENER DIODE		
D62			HZS11N(B2)	ZENER DIODE		
D62			RD11ES(B2)	ZENER DIODE		
D63 ,64			HZS15N(B)	ZENER DIODE		
D63 ,64			RD15ES(B)	ZENER DIODE		
D66		*	RBV-602LFA	DIODE		
D67 ,68			DSM1A1	DIODE		
IC3		*	CX7978	IC(STEREO 2DB STEP VOLUME)		
IC4			UPC4570C	IC(OP AMP X2)		
IC6			AN6556	IC(OP AMP X2)		
Q1 ,2			2SC3244	TRANSISTOR		
Q3 ,4			2SA1284	TRANSISTOR		
Q5 ,6		*	2SC3853	TRANSISTOR		
Q7 ,8		*	2SA1489	TRANSISTOR		
Q9 ,10			2SC945(A)(Q)	TRANSISTOR		
Q13 ,14			2SD1302(S)	TRANSISTOR		
Q21 ,22			2SA1127NC(R,S)	TRANSISTOR		
Q21 ,22			2SA733(A)(Q,P)	TRANSISTOR		
Q23			2SC1845(F,E)	TRANSISTOR		
Q24			2SD863	TRANSISTOR		
Q25			2SB764	TRANSISTOR		
CONTROL UNIT (X11-2320-01)						
C1			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C2 ,3			C91-0751-05	CERAMIC 330PF K		
C4			CE04KW1C330M	ELECTRO 33UF 16WV		
C5			CE04KW0J222M	ELECTRO 2200UF 6.3WV		
C6			CK45FF1H103Z	CERAMIC 0.010UF Z		

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C7 -13			C91-0757-05	CERAMIC 0.001UF K		
C14 -16			C91-0769-05	CERAMIC 0.01UF M		
X1			L78-0202-05	RESONATOR (400KHZ)		
CP1			R90-0228-05	MULTI-COMP 10KX5 J 1/6W		
CP2			R90-0286-05	MULTI-COMP 4.7KX4 J 1/6W		
CP3		*	R90-0478-05	COMPOSITE ELEMENTS		
S2 -13	2B		S40-1064-05	PUSH SWITCH		
D1			HZS10N(B)	ZENER DIODE		
D1			RD10ES(B)	ZENER DIODE		
D2 -13			1SS133	DIODE		
D2 -13			1SS176	DIODE		
FL1	2B	*	FIP7AMW24	FLUORESCENT INDICATOR TUBE		
IC1		*	UPD7538AC-023	IC(MICROPROCESSOR)		
Q1			DTC124EFF	DIGITAL TRANSISTOR		
SUB-CIRCUIT UNIT (X13-5520-00)						
IC1		*	CX7977	IC(FUNCTION SW FOR AUDIO)		
PREAMPLIFIER UNIT (X85-1032-72)						
C1 ,2			CE04FW1C100M	ELECTRO 10UF 16WV		
C3 ,4			CE04FW1A470M	ELECTRO 47UF 10WV		
C5			CF92FV1H123J	MF 0.012UF J		
C6			CF92FV1H123J	MF 0.012UF J		
C7			CF92FV1H332J	MF 3300PF J		
C8			CF92FV1H332J	MF 3300PF J		
C9 ,10			CE04KW1V100M	ELECTRO 10UF 35WV		
C11 ,12			CK45FF1H103Z	CERAMIC 0.010UF Z		
C15 ,16			CK45FB1H222K	CERAMIC 2200PF K		TEA
C15 ,16			CK45FB1H561K	CERAMIC 560PF K		UMUE
C17 ,18			CC45FSL1H101J	CERAMIC 100PF J		UMUE
C17 ,18			CC45FSL1H221J	CERAMIC 220PF J		TEA
IC1			AN6556	IC(OP AMP X2)		
IC1			M5218P	IC(OP AMP X2)		
PREAMPLIFIER UNIT (X85-1040-10)						
C1 ,2			CE04FW1H3R3M	ELECTRO 3.3UF 50WV		
C3 ,4			CC45FSL1H221J	CERAMIC 220PF J		
R11 ,12		*	RD14AB2E271J	FL-PROOF RD 270 J 1/4W		
R13 ,14			RD14AB2E181J	FL-PROOF RD 180 J 1/4W		
Q1 -4			2SA992(F,E)	TRANSISTOR		
Q5 -8			2SC1845(F,E)	TRANSISTOR		

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A-7X

SPECIFICATIONS

AUDIO SECTION [OVERALL CHARACTERISTICS] TUNER, TAPE to SPKR (Partially PHONO to SPKR)

Continuous Average Power Output

50 watts per channel minimum RMS, both channels driven, at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.06% total harmonic distortion.

Maximum continuous output power (IEC) from 60 Hz to 12,500 Hz, 0.7% THD	
at 8 ohms	60 W+60 W
Total Harmonic Distortion (20 Hz to 20,000 Hz) AUX→Speaker (8 ohms)/POWER in→Speaker (8 ohms)	
At rated output	0.06%
At 1/2 rated output	0.04%
Intermodulation Distortion (60 Hz:7 kHz=4:1)	0.04% at rated output into 8 ohms
Frequency Response Overall [AUX→SPEAKER]	10 Hz to 60 kHz, ±3 dB
PHONO "RIAA" Response (PHONO→REC OUT,	
20 Hz~20 kHz)	±0.4 dB
Signal-to-Noise ratio (IHF-A) at rated output	
PHONO MM (2.5 mV)	73 dB
TUNER, AUX, TAPE PLAY	97 dB
MIC	64 dB
Signal-to-Noise ratio at unweighted, 50 mW output (DIN)	
PHONO (MM)	50 dB
TUNER, AUX, TAPE PLAY	50 dB
Tone Control	
Bass	±10 dB at 100 Hz
Treble	±10 dB at 10 kHz
Damping Factor	40, at 50 Hz
Channel Separation (DIN) at 1,000 Hz	
PHONO (Terminated with 2.2 kΩ)	60 dB
AUX (Terminated with 47 kΩ+ 250 pF)	50 dB
Input Sensitivity/Impedance	
PHONO MM	2.5 mV/47 kohms
TUNER, AUX., TAPE PLAY	150 mV/47 kohms
MIC	1.3 mV/47 kohms
Phono Maximum Input Level (PHONO to TAPE REC)	
MM: 1,000 Hz, 0.06% THD	120 mV
Output Level/Impedance	
TAPE REC (Pin)	150 mV/3.3 kohms
General	
Power Consumption (IEC)	120 W
Dimensions	W: 340 mm H: 84 mm D: 362 mm
Weight (Net)	6.2 kg

Note :

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the Europe (E) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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